International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management, SGEM 2018 vol.18 N1.1, pages 449-456

Rhythm of carbonate deposits of the liven's horizon on electron paramagnetic resonance data

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Abstract

© SGEM2018. The paramagnetic properties of core samples from the section of the reference well was investigated on the basis of a representative sample (204 samples, along 1562, 9м – 1478,4m depth and 84,5m powerful) by electron paramagnetic resonance (EPR) for mineral associations of the Liven horizon of the Upper Devonian deposits of the Volga-Ural region of the Republic of Tatarstan. In fact, according to the results of the EPR studies, the Liven's horizon is a continuation of the regressive cycle of calcareous deposits of the Voronezh and Evlan horizons. Despite the differences in the mineral skeleton, geochemical processes in the formation of dolomitic rocks have the same tendency as in the calcareous section: upward in the section, the content of manganese increases, the concentration of syngenetic organic matter decreases and increases the frequency of occurrence sectional anhydrite interlayers. The main difference between dolomite rocks and limestone's is that secondary calcite was not formed within the dolomite section. This allows us to assume that in the calcareous section of the incision it is formed during the diagenesis of the already formed calcareous strata. Another difference is due to the capture of the phosphorous component exclusively by dolomite. At the same time, phosphorus plays an important role in the formation of interlayers of dolomitic and dolomite anhydrite. Despite the fact that the content of dolomite in these interlayers is small, the concentration of radiation phosphorous ion radicals in them, which are fixed in the EPR spectra, is clearly increased. This makes it possible to apply the signals discussed in order to reveal the rhythm of fluctuations in the water level in a shrinking sea basin. In total, until seventeen rhythms of the change in the sedimentation of the carbonate to the sulfate type are distinguished in the sediments of the Livonian horizon by the EPR, which are distinguished by peaks with the minimum manganese content and parameter alfa, while SO3- is the value in anhydrite and PO2 in the dolomite maximum.

http://dx.doi.org/10.5593/sgem2018/1.1/S01.057

Keywords

Anhydrite, Dolomite, Electron paramagnetic resonance, Limestone, Liven horizon, Organic matter, Upper Devonian

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